

Bachelor of Science in Natural Sciences

The Bachelor of Science (BS) in Natural Sciences provides a broad, customizable program of studies in the sciences, with coursework across multiple disciplines. It prepares students for advanced study or careers in the environmental sciences and the health professions. Graduates of the program have gone on to further study and jobs in a diversity of fields, such as veterinary, medical, and dental schools, and environmental consulting.

Admission Requirements

- Complete the Admission Requirements for Baccalaureate Programs (<http://catalog.uaa.alaska.edu/academicpoliciesprocesses/admissions/undergraduate/>).
- Declare the major (see major requirements) and select one of two options: Pre-health Professions or Environmental Sciences. To declare the BS in Natural Sciences as their major, students must meet with an advisor to be accepted into the major. To schedule an advising session, contact the Department of Biological Sciences. At the advising session students are required to choose one of the two options.

Graduation Requirements

- Complete the General University Requirements for Baccalaureate Degrees (<http://catalog.uaa.alaska.edu/undergraduateprograms/baccalaureaterequirements/>).
- Complete the General Education Requirements for Baccalaureate Degrees (<http://catalog.uaa.alaska.edu/undergraduateprograms/baccalaureaterequirements/gers/>).
- It is recommended that mathematical and statistical requirements be completed in the first two years of study.
- No more than 6 credits may come from courses designated as A495, A498 and A499 combined, with no more than 2 credits from A495.
- No more than 2 credits may be A492.
- Courses not listed as approved for the BS in Natural Sciences may be considered by petition, which should be signed by an advisor.
- All prerequisites for courses used to meet the natural sciences degree requirements must be completed with a minimum grade of C. Students who audit a course intended to meet the natural sciences degree requirements or who are unable to earn a minimum grade of C in the course may repeat the course. Students who audit or are unable to earn a minimum grade of C in a lower-division (100- or 200-level) Biology (BIOL) course may repeat the course two additional times on a space-available basis. Students who audit or are unable to earn a minimum grade of C in an upper-division (300- or 400-level) BIOL or Microbiology (MBIO) course may repeat the course one additional time on a space-available basis. Students repeating a BIOL or MBIO course are required to complete all components of that course during the semester in which the course is retaken. When repeating a course with a lecture and laboratory component, both components must be repeated. Students enrolled in

a BIOL or MBIO laboratory must attend lab the first week of class or they may be administratively dropped.

- All natural sciences majors are required to take an exit examination, a standardized test of knowledge. There is no minimum score required for graduation. The exam may be completed at the UAA Testing Center and a fee will be charged to students, or as part of BIOL A492.
- Complete the following major requirements with a minimum grade of C:

Environmental Sciences Option

| Code | Title | Credits |
|--------------------------------------------------------------------------------------|----------------------------------------------------------------|---------|
| BIOL A108 | Principles and Methods in Biology | 6 |
| BIOL A271 | Principles of Ecology | 3 |
| BIOL A273 | Experiential Learning: Ecology and Evolution | 4 |
| BIOL A288 | Principles of Evolution | 3 |
| BIOL A492 | Undergraduate Seminar | 1 |
| CHEM A105 & A105L | General Chemistry I and General Chemistry I Laboratory | 4 |
| CHEM A106 & A106L | General Chemistry II and General Chemistry II Laboratory | 4 |
| ECON A210 | Environmental Economics and Policy | 3 |
| GEOL A115 & A115L | Dangerous Earth and Dangerous Earth Laboratory | 4 |
| GEOG A470 | Environmental Policy and Regulation in Alaska | 3 |
| PHIL A303 | Environmental Ethics | 3 |
| STAT A253 or STAT A307 | Applied Statistics for the Sciences Probability and Statistics | 4 |
| Complete 48 elective credits from the following, of which 36 must be upper-division: | | 48 |

Biology and Microbiology Upper Division

Complete a minimum of 15 credits from the following:

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| BIOL A310 | Principles of Animal Physiology |
| BIOL A311 | Experiential Learning: Animal Physiology |
| BIOL A330 | Plant Biology |
| BIOL A415 | Comparative Animal Physiology |
| BIOL A418 | Fish Physiology |
| BIOL A423 | Ichthyology |
| BIOL A424 | Experiential Learning: Ichthyology |
| BIOL A427 | Marine Invertebrate Biology |
| BIOL A430 | Marine Mammal Biology |
| BIOL A431 | Plant Diversity and Evolution |
| BIOL A441 | Animal Behavior |
| BIOL A442 | Experiential Learning: Animal Behavior |

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| BIOL A446 | Global Climate Change |
| BIOL A455 | Experiential Learning: Bioinformatics |
| BIOL A467 | Wildlife Ecology |
| BIOL A469 | Arctic Environmental Security |
| BIOL A472 | Biogeography |
| BIOL A473 | Conservation Biology |
| BIOL/CHEM A474 | Ecotoxicology |
| BIOL A477 | Tundra and Taiga Ecosystems |
| BIOL A478 | Biological Oceanography |
| BIOL A481 | Marine Biology |
| BIOL A483 | Exploration Ecology |
| BIOL A484 | Experiential Learning: Exploration Ecology Field Study |
| BIOL A486 | Evolutionary Ecology |
| BIOL A490 | Selected Lecture Topics in Biology |
| BIOL A490L | Selected Laboratory Topics in Biology |
| BIOL A498 | Individual Research |
| BIOL A499 | Senior Thesis |
| MBIO A340 | Microbial Biology |
| MBIO A342 | Experiential Learning: Microbial Biology |
| MBIO A410 | Microbial Physiology |
| MBIO A440 | Microbial Diversity |
| MBIO A450 | Microbial Ecology |
| MBIO A468 | Geomicrobiology |
| MBIO A470 | Ecology and Evolution of Infectious Disease |

Geology Upper Division

Complete a minimum of 15 credits from the following:

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| GEOL A315 | Geological Data Visualization and Analysis |
| GEOL A331 | Sedimentology and Stratigraphy |
| GEOL A333 | Earthquakes and Seismic Hazards |
| GEOL A361 | Earth Resources and Society |
| GEOL A441 | Paleoclimatology |
| GEOL A444 | The Cryosphere |
| GEOL A461 | Geochemistry |
| GEOL A463 | Environmental Geochemistry |
| GEOL A480 | Geologic Field Methods |
| GEOL A490 | Advanced Topics in Geology |
| GEOL A498 | Student Research |
| GEOL A499 | Senior Thesis |

Math and Computational Skills

Complete a minimum of 12 credits from the following:

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| CS A109 | Computer Programming (Languages Vary) |
| or CSCE A201 | Computer Programming I |

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| CSCE A360 | Database Systems |
| GIS A458 | Spatial Data Management |
| GIS A466 | Spatial Analysis |
| GIS A467 | Image Analysis |
| MATH A251 | Calculus I |
| or MATH A251F | F.A.T. Calculus I |
| MATH A252 | Calculus II |
| or MATH A252F | F.A.T. Calculus II |
| MATH A253 | Calculus III |
| STAT A308 | Intermediate Statistics for the Sciences |
| STAT A402 | Scientific Sampling |
| STAT A403 | Regression Analysis |
| STAT A407 | Time Series Analysis |

Social Sciences Upper Division

Complete a minimum of 6 credits from the following:

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| ANTH A454 | Culture and Ecology |
| ANTH A477 | Cultural Resource Management |
| CEL A390 | Special Topics in Civic Engagement |
| ECON A445 | Methods for Public Policy Evaluation |
| ENGL A478 | Public Science Writing |
| GEOG A475 | Geospatial and Cartographic Techniques for the Sciences |
| SOC A404 | Environmental Sociology |

Total **90****Pre-Health Professions Option**

| Code | Title | Credits |
|-----------------------------------------------------------------------------------------|----------------------------------------------------------------|---------|
| BIOL A108 | Principles and Methods in Biology | 6 |
| BIOL A242 | Fundamentals of Cell Biology | 3 |
| BIOL A252 | Principles of Genetics | 3 |
| BIOL A492 | Undergraduate Seminar | 1 |
| CHEM A105 & A105L | General Chemistry I and General Chemistry I Laboratory | 4 |
| CHEM A106 & A106L | General Chemistry II and General Chemistry II Laboratory | 4 |
| CHEM A321 | Organic Chemistry I | 3 |
| CHEM A441 or MBIO A340 | Principles of Biochemistry I ¹ Microbial Biology | 3 |
| PHYS A123 & A123L | College Physics I and College Physics I Laboratory | 4 |
| PHYS A124 & A124L | College Physics II and College Physics II Laboratory | 4 |
| Complete 54 elective credits from the following, of which 31 must be upper-division: | | 54 |

Natural Sciences

Complete a minimum of 21 credits from the following:

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| BIOL A111 | Human Anatomy and Physiology I |
| BIOL A111L | Human Anatomy and Physiology I Lab |
| BIOL A112 | Human Anatomy and Physiology II |
| BIOL A112L | Human Anatomy and Physiology II Lab |
| BIOL A200 | Introduction to Complexity |
| BIOL A240 | Introductory Microbiology for Health Sciences ² |
| BIOL A240L | Introductory Microbiology for Health Sciences Laboratory ³ |
| BIOL A243 | Experiential Learning: Cell Biology and Genetics |
| BIOL A288 | Principles of Evolution |
| BIOL A310 | Principles of Animal Physiology |
| BIOL A311 | Experiential Learning: Animal Physiology |
| BIOL A320 | Vertebrate Biology |
| BIOL A321 | Experiential Learning: Vertebrate Biology |
| BIOL A412 | Behavioral Endocrinology |
| BIOL A413 | Neurophysiology |
| BIOL A415 | Comparative Animal Physiology |
| BIOL A417 | Applied Kinesiology and Exercise Physiology |
| BIOL A419 | Sleep and Chronobiology |
| BIOL A452 | Human Genome |
| BIOL A455 | Experiential Learning: Bioinformatics |
| BIOL A461 | Molecular Biology |
| BIOL A463 | Molecular Biology of Cancer |
| BIOL A465 | Experiential Learning: Molecular Biology |
| BIOL/CHEM A471 | Immunology |
| BIOL A487 | Comparative Anatomy of Vertebrates |
| BIOL A490 | Selected Lecture Topics in Biology |
| BIOL A490L | Selected Laboratory Topics in Biology |
| BIOL A495A | Internship in the Biological Sciences |
| BIOL A498 | Individual Research |
| BIOM A418 | Human Gross Anatomy |
| CHEM A312 | Quantitative Analysis |
| CHEM A322 | Organic Chemistry II |
| CHEM A323L | Organic Chemistry Laboratory |
| CHEM A411 | Biophysical Chemistry |
| CHEM A442 | Principles of Biochemistry II |
| CHEM A443 | Biochemistry Laboratory |

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| CHEM A498 | Individual Research |
| MBIO A342 | Experiential Learning: Microbial Biology ³ |
| MBIO A410 | Microbial Physiology |
| MBIO A460 | Host-Microbiome Interactions |
| MBIO A462 | Virology |
| MBIO A470 | Ecology and Evolution of Infectious Disease |
| PHYS/BIOL/CHEM A456 | Nonlinear Dynamics and Chaos |

Social Sciences

Complete a minimum of 15 credits from the following:

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| ANTH A101 | Introduction to Anthropology |
| ANTH A205 | Biological Anthropology |
| ANTH A452 | Culture and Human Biodiversity |
| ANTH A455 | Culture and Health |
| ANTH A490 | Selected Topics in Anthropology |
| ECON A101 | Principles of Microeconomics |
| ECON A102 | Principles of Macroeconomics |
| HS A210 | Introduction to Environmental Health |
| HS A220 | Introduction to Population Health Sciences |
| HS A230 | Introduction to Global Health |
| HS A326 | Introduction to Epidemiology |
| HS A370 | Social and Cultural Determinants of Health |
| HS A492 | Senior Seminar: Contemporary Health Policy |
| KIN A383 | Movement Theory and Motor Development |
| KIN A384 | Cultural and Psychological Aspects of Health and Physical Activity |
| PHIL A302 | Biomedical Ethics |
| PSY A111 | Introduction to Psychology |
| PSY A143 | Death and Dying |
| PSY A150 | Lifespan Development |
| PSY A200 | Introduction to Behavior Analysis |
| PSY A260 | Statistics for Psychology |
| PSY A260L | Statistics for Psychology Lab |
| PSY A261 | Research Methods in Psychology |
| PSY A261L | Research Methods in Psychology Laboratory |
| PSY A316 | Motivation and Emotion |
| PSY A345 | Psychopathology |
| PSY A366 | Sensation and Perception |
| PSY A367 | Cognitive Psychology |
| PSY A368 | Personality |
| PSY A370 | Behavioral Neuroscience |
| PSY A375 | Social Psychology |

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| PSY A398 | Individual Research |
| PSY A400 | Strategies of Behavior Change |
| PSY A412 | History of Psychology |
| PSY A425 | Clinical Psychology |
| PSY A428 | Evolutionary Psychology |
| PSY A442 | Psychopathology of Childhood and Adolescence |
| PSY A447 | Behavioral Treatment of Autism Spectrum Disorder |
| PSY A450 | Adult Development and Aging |
| PSY A455 | Interventions for Challenging Behavior |
| PSY A485 | Health Psychology |
| PSY A498 | Individual Research |

Math and Computational Skills

Complete a minimum of 9 credits from the following:

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| MATH A221 | Applied Calculus for Managerial and Social Sciences |
| or MATH A251 | Calculus I |
| or MATH A251F | F.A.T. Calculus I |
| MATH A252 | Calculus II |
| or MATH A252F | F.A.T. Calculus II |
| MATH A253 | Calculus III |
| MATH A261 | Introduction to Discrete Mathematics |
| MATH A265 | Fundamentals of Mathematics |
| MATH A302 | Ordinary Differential Equations |
| MATH A305 | Introduction to Geometries |
| MATH A306 | Discrete Methods |
| MATH A314 | Linear Algebra |
| MATH A401 | Introduction to Real Analysis |
| MATH A405 | Introduction to Abstract Algebra |
| MATH A410 | Introduction to Complex Analysis |
| MATH A432 | Partial Differential Equations |
| MATH A498 | Individual Research |
| STAT A253 | Applied Statistics for the Sciences |
| or STAT A307 | Probability and Statistics |
| STAT A308 | Intermediate Statistics for the Sciences |
| STAT A402 | Scientific Sampling |
| STAT A403 | Regression Analysis |
| STAT A407 | Time Series Analysis |

Total **89**

¹ If both CHEM A441 and MBIO A340 are taken, one will count as the required course and the other will count as a natural sciences elective.

² Students may not apply BIOL A240 and MBIO A340 toward their natural sciences electives.

³ Students may not apply BIOL A240L and MBIO A342 toward their natural sciences electives.

A minimum of 120 credits is required for the degree, of which 39 must be upper-division.